

## Data Regarding Rural Electrification Administration Telephone Systems

The accompanying tables represent information regarding the principal features of a representative group of Rural Electrification Administration telephone system which are important from the standpoint of transmission, subscriber signaling and supervision, crosstalk and inductive and structural coordination.

These data have been summarized in accordance with a memorandum prepared by Dr. H. M. Trueblood entitled "Collection of data regarding REA Telephone Systems" dated April 10, 1952, revised November 8, 1952.

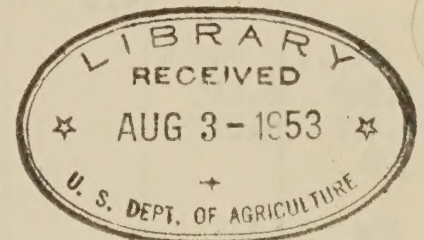
The tables cover information from recent area coverage designs, and include the data shown below. Details for each system included in the study are shown in the tables.

Table 1 - Offices and Subscriber Lines. This table covers the number of Central Offices, and the initial and ultimate number of subscriber lines and stations for each system studied and totals for the group.

Table 2A	Trunk Line Plant - Carrier Frequency Trunks
Table 2B	Voice Frequency Trunks
Table 3A	Subscriber Loop Lengths - Longest Loop for Each System
Table 3B	Distribution of Subscribers by Zones
Table 3C	Distribution of Subscriber Lines Terminating in Each Zone
Table 3D	Characteristics of Subscriber Loops Terminating in Each Zone

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Washington 25, D. C.



June 3, 1953







Table 1. Office and Subscriber Lines

Project Number	System	Number of Central Offices	Initial		Ultimate	
			Sub. Lines	No. of Subs.	Sub. Lines	No. of Subs..
Colorado 501	Wiggins Telephone Assn.	2	120	308	260	520
Georgia 510	Public Ser. Tel. Co.	6	780	1,625	-	-
Georgia 515	Brantley Telephone Co.	2	188	342	240	500
Iowa 503	Mutual Telephone Co.	1	437	1,197	532	1,502
Iowa 508	Farmers Mut. Tel. Co.	1	209	337	277	449
Kansas 531	United Telephone Assn.	3	325	821	-	-
Louisiana 504	LaSalle Telephone Co.	5	1,046	1,883	-	-
Louisiana 506	Lafourche Tel. Company	6	1,180	1,207	-	-
Michigan 503	Lawrence Telephone CO.	1	190	612	300	800
Mississippi 506	Bay Springs Tel. Co.	2	583	1,592	610	1,900
New Mexico 502	Roosevelt County Rural	6	220	818	-	-
New Mexico 504	Clovis Telephone Co.	7	255	705	290	835
N. Carolina 509	Yadkinville Tel. Co.	1	75	280	100	400
Tennessee 521	Dekalb County	3	165	511	221	755
Tennessee 544	Twin Lakes Tel. Coop.	6	575	1,306	-	-
Texas 528	Wes Tex. Tel. Coop	4	150	583	210	972
Texas 544	Taylor Tel. Coop	12	460	1,135	-	-
Texas 561	Southwest Texas Tel.	2	60	276	-	-
Texas 562	Valley Tel. Coop	4	120	359	-	-
Utah 501	Emery County Farmers	4	310	541	410	824
Total 20 systems		78	7,448	16,438		
Average per system		3.9	372.4	821.9		
Average per Central Office			95.5	210.7		
Average per subscriber line				2.2		
Totals - 11 systems		28			3,450	9,457
Average per system		2.5			313.6	859.7
Average per central office					123.2	337.8
Average per subscriber line						2.7
Percent increase over initial (11 systems)					33%	35%

NOTES: All of the above central offices are non-attended dial central offices except one--Larose central office of the Lafourche Telephone Company, Louisiana 506, which will have six toll positions in addition to the dial equipment.

There were no manual main central offices, satellite offices, or concentrator units included in the above system.

Area coverage designs for systems which do not show the ultimate conditions did not include this information.





Table 2A Trunk Line Plant  
Summary of Carrier Frequency Trunks

Project Number	System	Number of Trunks	Pole Line -Miles	Physical Circuit - Miles	Two-Way Carrier Channel - Miles	Maximum Length of Trunk	Average Length of Trunks
Iowa 503	Mutual Tel. Co.	2	25.8	25.8	51.6	25.8	25.8
Ga. 510	Public Service Tel. Co.	31	118.7	194.6	1044.3	47.7	33.7
La. 506	Lafourche Tel. Co.	6	46.0	92.0	276.0	46.0	46.0
N.Mex.502	Roosevelt County	10	85.5	134.2	285.4	37.9	28.5
N.Mex.504	Clovis Tel. Co.	7	44.0	44.0	308.0	44.0	44.0
Tenn. 544	Twin Lakes	6	21.95	43.9	131.7	21.95	21.95
Tex. 544	Taylor Tel. Co.	6	18.5	18.5	111.0	18.5	18.5
Tex. 562	Valley Tel. Co.	4	48.0	48.0	103.5	48.0	25.9
	Totals	72	408.45	601.0	2311.5	48.0	32.1

Average number of channels on pole line 5.6

Average number of channels on physical circuit 3.8

Makeup of physical circuits

.104 Cw non-phantomed	220.3
.104 CW side circuit of phantom	196.4
.104 HD copper non-phantomed	132.5
.104 HD copper side ckt. of phantom	51.8





Table 2B, Trunk Line Plant  
Summary of Voice Frequency Trunks in Cable  
and in Cable and Open-Wire

Project Number	System	Number of Trunk Groups	Number of Trunks	Trunks per Trunk Group	Maximum Length Miles	Total Miles		Average Length Miles	No. of Trunks Repeated
						Trunk Circuit			
						Open Wire	Cable		
Colo.501	Wiggins Tel. Co. Toll trunks	2	9	4.5	16	135	-	15	-
Ga. 510	Public Service Toll trunks	1	*1	7.0	37	37	-	37	-
	Intra system	8	30	3.75	21.5	365.9	-	12.2	-
Ga. 536	Bullock County Toll trunks	3	11	3.67	12.9	111.7	11.8	11.23	-
	Intra system	3	16	5.33	12.9	124.2	54.6	11.12	-
Iowa 503	Mutual Tel. Co. Toll trunks	4	11	2.75	25.8	183.2	24.6	17.2	-
La. 504	LaSalle Tel. Co. Toll trunks	5	24	4.8	57.9	909.5	-	37.9	-
	Intra system	4	20	5.0	16.1	78.2	122.4	10.0	-
La. 506	Lafourche Tel.Co. Toll trunks	4	20	5.0	25.9	283.3	23.5	13.1	-
	Intra system	6	60	10.0	15.3	-	512.0	8.5	-
Mich.503	Lawrence Tel. Co. Toll trunks	1	*1	1.0	9.0	9.0	-	9.0	-
Miss.506	Bay Springs Intra system	1	25	25.0	11.0	-	271.3	11.8	-
N.Mex502	Roosevelt County Toll trunks	4	12	3.0	24.8	220.5	-	18.3	-
	Intra system	2	6	3.0	20.8	110.4	-	18.4	-
N.Mex504	Clovis Tel. Co. Toll trunks	1	*14	14.0	23.0	322.0	-	24.0	-
	Intra system	2	14	7.0	14.0	-	140.0	10.0	-
Tenn.544	Twin Lakes Toll trunks	6	*15	2.5	49.6	94.7	282.8	25.2	16
	Intra system	6	10	2.2	21.9	52.5	55.7	10.8	
Tex. 528	Wes Tex.Tel.Coop Toll trunks	4	25	6.2	14.7	153.0	122.7	11.0	20
Tex. 544	Taylor Tel. Coop Toll trunks	10	40	4.0	20.4	341.2	127.8	11.7	12
	Intra system	3	11	3.7	17.4	69.9	75.8	13.3	-







Table 2B, Trunk Line Plant - continued  
Summary of Voice Frequency Trunks in Cable  
and in Cable and Open-Wire

Project Number	System	Number of Trunk Groups	Number of Trunks	Trunks per Trunk Group	Maximum Length Miles	Total Miles		Average Length Miles	No. of Trunks Repeated
						Trunk Open Wire	Circuit Cable		
Tex. 561	Southwest Texas								
	Toll trunks	2	5	2.5	20.6	79.6	4.2	16.7	-
	Intra system	2	7	3.5	11.0	42.6	5.6	6.9	-
Tex. 562	Valley Tel. Coop.								
	Toll trunks	4	*10	2.5	48.0	160.8	5.7	16.6	-
	Intra system	3	12	4.0	17.4	132.8	8.9	11.8	-
Tenn. 521	DeKalb County								
	Toll trunks	1	12	12.0	7.2	86.4	-	7.2	-
Utah 501	Emery County								
	Toll trunks	1	6	6.0	17.0	60.0	-	10.0	-
Total toll trunks		53	216	4.1	57.9	3141.9	603.1	17.3	-
Total intra system trunks		40	211	5.3	21.9	976.5	1246.3	10.5	-
Grand total		93	427	4.6		4118.4	1849.4	14.0	48

\* Does not include Carrier Frequency trunks shown in Table 2A

Makeup of Open Wire Circuits			Makeup of Cable Circuits		
Kind of wire	Circuit Miles		Gauge & loading	Circuit Miles	
.104 HD copper non-phantomed	1,461.7		13 ga. loaded	6.0	
" side of phantom	155.8		19 ga. non-loaded	36.3	
" phantom	77.9		19 ga. loaded	995.6	
.104 CW 40% non-phantomed	1,273.3		22 ga. non-loaded	78.0	
" side of phantom	451.4		22 ga. loaded	493.8	
" phantom	225.7		24 ga. non-loaded	9.0	
.104 CW 30% non-phantomed	153.0		24 ga. loaded	189.9	
.080 CW 40% non-phantomed	11.4		26 ga. non-loaded	21.0	
" " side of phantom	75.2		26 ga. loaded	19.2	
" " phantom	37.6				
.109-85 steel non-phantomed	195.4		Total	1,848.8	
Total	4,118.4				







Table 3A Subscriber Loop Lengths

Project Number	System or Exchange	Longest Loop						
		Over-all Length Miles	Open Wire Miles	Gauge & material	Cable portion Miles	Gauge & Loading	Effective Trans. db	Loop Resistance ohms
Col. 501	Wiggins Telephone Assn.	14.50	11.25 2.50	109S 104CW	.75	19g NL	-.29	988
Ga. 515	Brantley Telephone Co.	20.93	12.00 8.70	109S 104CW	.23 -	22g NL -	- +1.38	- 1,182
Ga. 536	Bullock County Tel. Coop.							
	Portal	18.02	17.60	080CW	.42	22g NL	-1.99	804
	Brooklet	18.10	17.23	080CW	.87	22g NL	-1.05	860
	Portal	17.15	11.60	104CW	5.55	22gH88	+.45	1,248
Iowa 503	Mutual Telephone Company	14.00	6.80 4.70	109S 104CW	2.50 -	22g NL -	- +.04	- 1,011
Iowa 508	Farmers Mut. Tel. Co.	8.00	6.00	109S	2.00	22gNL	+.92	750
Kan. 531	United Tel. Assn.	18.40	2.00 14.20	109S 104CW	2.28 -	22gNL -	-.64 -	988 -
La. 504	LaSalle Tel. Co., Jena	14.86	6.44 5.28	109S 104CW	1.35 1.79	19gH88 22gH88	- +.47	- 994
	do	12.59	3.97 3.78	109S 104CW	2.93 1.79	19gH88 22gH88	- -.02	- 926
	do	11.98	7.18 2.08	109S 104CW	2.73 -	22gH88 -	+.04 -	1,008 -
La. 506	LaFourche Tel. Co. Galliano	5.00	-	-	3.90 1.10	22gH88 24gH88	- -.05	- 1,012
	Leeville	9.85	8.15	104Cop	1.70	22g NL	-4.22	375
	Grand Isle	8.40	3.78	104Cop	4.40 .24	22gH44 24gH44	- -1.05	- 877
Mich. 503	Lawrence Telephone Co.	8.70	3.75 2.85	109S 104CW	1.70 .36	22gNL 24g NL	- -.05	- 760
Miss. 506	*Bay Springs Tel. Co.	17.97	8.67	109S	4.16	19gH88	-	-
	Bay Springs Exchange		4.16	104CW	.66 .32	22gH88 24gH88	- +.07	- 1,275
	Soso Exchange	14.45	5.30 .94	109S 104CW	6.40 1.70 .38	19gH88 22gH88 24gH88	- +.07	- 1,286

\*Note: 40 local battery telephone sets to be used in this exchange





Table 3A Subscriber Loop Lengths - continued

Project Number	System or Exchange	Longest Loop						
		Over-all Length Miles	Open Wire Miles	Gauge & material	Cable Portion Miles	Gauge & Loading	Effective Trans. ohms	Loop Resistance ohms
N.Mex.502	Roosevelt County Rural							
	Floyd	29.8	29.4	104CW	.40	22g NL	-2.53	821
	Arch C.O.	21.4	19.9	104CW	1.50	22g NL	-1.14	766
	Elida C. O.	27.7	27.3	104CW	.40	22g NL	-2.36	769
N.Mex.504	Clovis Tel. CO.	17.0	14.0	109S	3.00	19g NL	+5.76	1,320
N.Car.509	Yadkinville	13.13	7.03	109S	2.41	22gH44	+4.4	1,032
			3.69	104CW	-	-	-	-
Tenn. 544	Twin Lakes Tel. Coop.	12.08	5.23	109S	4.05	22gH88	+ .75	1,205
			2.80	104CW	-	-	-	-
Tex. 528	Wes Tex Tel. Coop Lomax	16.0	9.00	109S	-	-	-1.05	929
			7.00	104CW	-	-	-	-
	Richland	16.0	10.50	109S	-	-	- .64	992
			5.50	104CW				
	Courtney	19.9	18.30	104CW	1.6	19g NL	+ .25	767
	Lenorah	15.8	9.90	104CW	5.9	19gH88	+ .04	838
Utah 501	Emery County Farmers	10.75	8.50	080CW	2.25	22gNL	+ .90	755





Table 3-B, Subscriber Loop Lengths

## Distribution of Subscribers by Zones

Project Number	System Exchanges	Total Subscribers Initial	Zone							
			1	2	3	4	5	6	7	8
			0 to 4 mi.	4 to 6 mi.	6 to 8 mi.	8 to 10 mi.	10 to 12 mi.	12 to 14 mi.	14 to 16 mi.	over 16 mi.
Colo. 501	Wiggins Tel. Co.									
	Wiggins Co.	199	133	40	13	4	3	6	-	-
	Hoyt Co.	109	53	30	14	6	5	1	-	-
	Total	308	186	70	27	10	8	7	-	-
Ga. 515	Brantley Tel. Co.									
	Nahunta	251	183	17	13	22	0	11	3	2
	Hoboken	91	82	7	2	-	-	-	-	-
	Total	342	265	24	15	22	0	11	3	2
Iowa 503	Mutual Telephone Co.									
	Souix City	1,197	847	141	113	70	18	8	-	-
Iowa 508	Farmers Mutual									
	Shellburg	337	264	60	13	-	-	-	-	-
Kan. 531	United Tel. Assn. (Spearville)	720	529	32	58	44	49	8	-	-
	Hanston									
	Kingsdown	101	56	27	12	4	2	-	-	-
	Total	821	585	59	70	48	51	8	-	-
Mich. 503	Lawrence Tel. Co.	612	444	129	36	3	-	-	-	-
N.Mex. 504	Clovis Tel. Co.									
	South Clovis	64	19	11	11	9	9	2	3	-
	Pleasant Hill	89	23	12	20	10	7	13	4	-
	Ranchvale	163	52	22	30	25	17	12	5	-
	Bellview	122	46	16	22	18	12	8	-	-
	Grady	122	51	17	17	18	9	6	4	-
	Weber City	55	12	10	9	9	7	5	3	-
	Ragland	90	25	23	14	13	9	6	-	-
	Total	705	228	111	123	102	70	52	19	-
N.Car. 509	Yadkinville Tel. Co.									
	Yadkinville	280	139	37	54	40	10	-	-	-
Tenn. 521	Dekalb County									
	Alexandria	204	200	3	1	-	-	-	-	-
	Liberty	202	175	20	7	-	-	-	-	-
	Temperance Hall	105	79	6	14	6	-	-	-	-
	Total	511	454	29	22	6	-	-	-	-
Tex. 528	Wes Tex. Tel. Coop									
	Lomax	42	15	4	5	11	5	-	2	-
	Richland	72	20	14	12	15	5	5	1	-
	Courtney	80	29	8	14	8	9	4	4	1
	Lenorah	158	49	23	34	16	18	12	1	5
	Total	352	113	49	65	50	37	21	8	9





Table 3-B, Subscriber Loop Lengths - continued

## Distribution of Subscribers by Zones - continued

Project Number	System Exchanges	Total Subscribers Initial	Zones							
			1 0 to 4 mi.	2 4 to 6 mi.	3 6 to 8 mi.	4 8 to 10 mi.	5 10 to 12 mi.	6 12 to 14 mi.	7 14 to 16 mi.	8 over 16 mi.
Utah 501	Emery County Farmers									
	Cleveland	130	112	11	7	-	-	-	-	-
	Castle Dale	227	214	2	2	5	4	-	-	-
	Ferron	118	105	12	1	-	-	-	-	-
	Emery	66	59	2	3	2	-	-	-	-
	Total	541	490	27	13	7	4	-	-	-
	Grand Total	6,006	4,015	736	551	358	198	107	30	11
	Percent in each zone	100.00	66.85	12.26	9.17	5.96	3.30	1.78	.50	.18

## Summary of 11 Systems

## Distribution of Subscribers by Zones

Zone Number	Distance from Central Office	Total Number of Subscribers	Average per System	Percent of Total	Area of Zones - Square Mile	Percent of Total Area	Average Number Subscribers per Sq. Mi
1	0 to 4 mi.	4,015	365	66.8%	32	6.3%	11.4
2	4 to 6 mi.	736	67	12.3	40	7.8	1.7
3	6 to 8 mi.	551	50	9.2	56	10.9	0.9
4	8 to 10 mi.	358	32	5.9	72	14.1	0.4
5	10 to 12 mi.	198	18	3.3	88	17.2	0.2
6	12 to 14 mi.	107	10	1.8	104	20.3	0.1
7	over 14 mi.	41	4	0.7	120	23.4	-
	Totals	4,006	546	100.0	512		





Table 3-C, Subscriber Loop Lengths

## Subscriber Lines Ending in Zones

Project Number	System	Total Subscriber Lines	Z o n e s							
			1	2	3	4	5	6	7	8
			0 to 4 mi.	4 to 6 mi.	6 to 8 mi.	8 to 10 mi.	10 to 12 mi.	12 to 14 mi.	14 to 16 mi.	over 16 mi.
Colo. 501	Wiggins Telephone Co.	120	76	25	10	5	2	2	-	-
Ga. 515	Brantley Tel. Co.	188	168	4	6	4	0	1	3	2
Iowa 503	Mutual Tel. Co.	437	383	14	17	14	8	1	0	0
Iowa 508	Farmers Mutual	209	194	8	7	-	-	-	-	-
Kansas 531	United Tel. Assn.	325	277	10	13	10	8	7	-	-
Mich. 503	Lawrence Tel. Co.	190	154	27	8	1	-	-	-	-
N. Mex. 504	Clovis Tel. Co.	255	107	17	35	36	23	26	11	-
N. Car. 509	Yadkinville	75	36	11	12	11	5	-	-	-
Tenn. 521	DeKalb County	165	142	14	7	2	-	-	-	-
Tex. 528	Wes Tex. Tel. Coop	98	31	10	15	16	10	6	4	6
Utah 501	Emory County	310	289	12	5	2	2	-	-	-
	Totals	2,372	1,857	152	135	101	58	43	18	8
	% distribution by zones	100.00	78.29	6.41	5.69	4.26	2.45	1.81	.76	.33
	Subscriber stations by zones (From Table 3B)	6,006	4,015	736	551	358	198	107	30	11
	Average number of stations per line in each zone	2.53	2.16	4.84	4.08	3.54	3.41	2.49	1.67	1.38





**Table 3D - Subscriber Loop Lengths**  
**Characteristics of Subscriber Loops Terminating in Each Zone**

Project Number	System	Loop Length Miles	Open Wire Portion		Cable Miles	Portion Gauge & Loading	Effective Trans- mission db	Loop Resis- tance- Ohms
			Miles	Gauge and Material				
Zone 1, 0 to 4 miles from Central Office								
Approximately 66% of the subscribers in the systems studied are located in Zone 1 and generally the aerial cable plant also is concentrated in this zone. Cables serving subscribers in this zone are non-loaded 22 ga. and 24 ga. and the open wire portion of the loops connecting with these cables is .109-135 steel wire. Following are characteristics of representative subscriber loops in this zone.								
Colo.501	Wiggins Tel. Co.	3.27	3.18	.109-135 st	.09	19ga NL	-4.4	250
do	do	3.14	3.14	.109-135 st	-		-4.0	240
Kan. 531	United Tel. Assn.	3.73	3.60	.109-135 st	.13	24ga NL	-4.85	311
do	do	4.00	3.30	.109-135 st	.70	24ga NL	-3.68	444
La. 504	LaSalle Tel. Co.	2.36	1.89	.109-135 st	.47	24ga NL	-5.74	259
do	do	2.64	-	-	(1.62	19ga NL	-4.60	336
do	do				(1.02	22ga NL		
do	do	2.83	2.18	.109-135st	.65	24ga NL	-4.95	327
do	do	3.03	2.40	.109-135st	.63	24ga NL	-4.83	335
do	do	3.22	2.56	.109-135st	.66	24ga NL	-5.03	356
do	do	3.48	3.22	.109-135st	.26	22ga NL	-5.27	309
do	do	3.97	3.32	.109-135st	.65	24ga NL	-3.95	405
La.506	Lafourche Tel. Co.	1.21	-		(.53	22ga NL	-6.80	278
					(.68	24ga NL		
do	do	1.89	-		1.89	24ga NL	-4.37	519
do	do	1.97			(1.04	22ga NL	-4.92	433
					(.93	24ga NL		
do	do	2.14			2.14	22ga NL	-5.17	366
do	do	2.23	.30	.109-135st	(1.29	22ga NL	-4.62	416
					(.64	24ga NL		
do	do	3.21	-		(1.51	22ga NL	-.93	726
					(1.70	24ga NL		
do	do	3.78			(2.95	22ga NL	-.10	734
					(.83	24ga NL		
do	do	3.98			3.74	22ga NL	-.05	705
					.24	24ga NL		





Table 3-D, Subscriber Loop Lengths - continued  
 Characteristics of Subscriber Loops Terminating in Each Zone

Project Number	System	Loop Length Miles	Open Wire Portion		Cable	Portion	Effec- tive Trans- mission db	Loop Resis- tance - Ohms
			Miles	Gauge and Material	Miles	Gauge & loading		
Zone 1 - continued								
Mich. 503	Lawrence Tel. Co.	3.80	2.00	.109-135 st	1.80	22 g NL	-2.10	480
N.C. 509	Yadkinville	3.10	1.60	.109-135 st	1.50	22 g NL	-1.50	380
N. Mex 504	Clovis Tel. Co.	2.75	2.75	.109-135 st	-		-6.10	230
do	do	3.00	2.00	.109-135 st	1.00	19 g NL	-4.00	237
do	do	3.00	1.50	.109-135 st	1.50	19 g NL	-3.80	245
do	do	4.00	1.00	.109-135 st	3.00	19 g NL	-1.65	331
do	do	4.00	-		4.00	19 g NL	-2.48	340
Tenn. 544	Twin Lakes	3.63	2.29	.109-135 st	1.34	24 g NL	-2.79	543
Utah 501	Emery County	3.01	2.71	.080 CW	.30	22 g NL	-7.04	170
do	(Orangeville)	3.18	2.50	.080 CW	.68	22 g NL	-6.29	226
do	do	3.00	1.67	.080 CW	1.33	22 g NL	-5.35	300
do	do	3.01	1.61	.080 CW	1.40	22 g NL	-5.22	310
Subtotals			42.23	.109-135 st	11.21	19 ga NL		
			8.49	.080-CW 40%	21.49	22 ga NL		
					12.14	24 ga NL		
Total for 31 loops		95.56	50.72		44.84			
Average loop		3.08	1.63		1.45		-2.43	374





**Table 3D - Subscriber Loop Lengths**  
**Characteristics of Subscriber Loops Terminating in Each Zone**

Project Number	System	Loop Length Miles	Open Wire Portion		Cable Portion		Effective Trans- mission db	Loop Resis- tance - Ohms
			Miles	Gauge and Material	Miles	Gauge & loading		
Zone 2, 4 to 6 miles from Central Office								
This zone is beyond the transmission limits of non-loaded 22-gauge and 24-gauge cable and service is generally furnished by .109-135 steel wire extensions beyond the end of these cables terminating in Zone 1. In a few cases 19-gauge cable is used, and where the number of lines exceed the economic capacity of aerial wire lines, loaded cables are used. Characteristics of representative subscriber loops in this zone follow.								
Colo. 501	Wiggins Tel. Co.	5.75	5.0	.109-135st	.75	19 g NL	-2.7	388
Kan. 531	United Tel. Assn.	5.20	4.5	.109-135st	.70	22 g NL	-3.4	458
La. 504	LaSalle Tel. Co.	4.64	-	-	(2.85	19 g NL	-.06	548
do	do				(1.79	22 g NI		
do	do	5.55	3.79	.109-135st	1.76	22 g NL	-1.79	408
do	do	4.83			(3.50	19 g NL	+.07	525
					(1.33	22 g NL		
do	do	4.34	3.06	.109-135st	1.28	24 g NL	-2.35	558
La. 506	Lafourche Tel. Co.	5.02	-		(3.92	22g H 88	-.05	1,012
do	do				(1.10	24g H 88		
do	do	5.78	.57	.104 Cop.	(4.97	22ga H44	-.26	941
					(.24	24gaH 44		
do	do	4.16	1.34	.104 Cop.	(1.84	22ga HL	-1.77	597
					(.98	24ga NL		
Mich. 503	Lawrence Tel. Co.	5.80	4.00	.109-135st	1.80	22 g NL	-1.10	633
N.Mex. 504	Clovis Tel. Co.	5.50	2.00	.109-135st	3.50	19g H 88	-3.00	415
do	do	5.00	3.00	.109-135st	2.00	19g NL	-2.00	385
N.C. 509	Yadkinville	5.00	1.00	.109-135st	4.00	19g NL	+.50	416
Utah 501	Emery County	5.06	3.73	.080 cw	1.33	22g NL	-4.54	390
do	do	5.23	4.55	.080 cw	.68	22g NL	-5.79	305
do	do	5.95	4.55	.080 cw	1.40	22g NL	-4.15	428
do	do	6.36	6.06	.080 cw	.30	22g HL	-5.94	165
Totals for 17 loops		89.17	47.15		3.60	24g		
					21.82	22g		
					16.60	19g		
Average loop		5.24	2.77		42.02		-1.83	572
					2.47			





**Table 3D - Subscriber Loop Length**  
**Characteristics of Subscriber Loops Terminating in Each Zone**

Project Number	System	Loop Length Miles	Open	Wire Portion	Cable Portion		Effective Trans- mission db	Loop Resis- tance Ohms	
			Miles	Gauge and Material	Miles	Gauge & loading			
	Zone 3, 6 to 8 miles from Central Office								
Colo.501	Wiggins Tel. Co.	7.95	7.20	.109-135 st	.75	19ga NL	-.78	615	
do	do	7.00	7.00	.109-135 st	-		-3.47	535	
Kan. 531	United Tel. Assn.	7.00	6.30	.109-135 st	.70	22ga NL	-1.65	604	
La. 504	LaSalle Tel. Co.	6.06	3.34	.109-135 st	2.72	22ga NL	+.03	721	
do	do	6.25	3.69	.109-135 st	2.56	22ga NL	-.08	720	
do	do	7.09	4.54	.109-135 st	2.30	22ga H44	-.85	809	
					.25	24ga H44			
do	do	7.95	6.92	.109-135 st	1.03	22ga NL	-.81	811	
La. 506	Lafourche Tel. Co.	7.01	3.79	.104 Cop.	.90	22ga NL	-.23	794	
					2.32	24ga NL			
Mich.503	Lawrence Tel. Co.	7.67	5.00	.109-135 st	2.67	22ga NL	+.91	838	
N.Mex504	Clovis Tel. Co.	7.00	7.00	.109-135 st	-		-4.00	535	
do	do	7.00	6.00	.109-135 st	1.00	19ga NL	-1.52	545	
do	do	7.00	3.50	.109-135 st	3.50	19ga NL	-1.60	568	
NC 509	Yadkinville	6.90	1.90	.109-135 st	5.00	19ga NL	+1.70	570	
Miss.506	Bay Springs	6.97	5.02	.109-135 st	1.61	22ga NL	-.25	697	
					.34	24ga NL			
do	do	7.58	6.07	.109-135 st	1.21	22ga NL	-.64	687	
					.30	24ga NL			
Utah 501	Emery County	7.00	5.67	.080 cw	1.33	22ga NL	-3.50	474	
do	do	7.00	6.32	.080 cw	.68	22ga NL	-5.07	392	
Subtotals			73.48	.109-135 st	10.25	19ga NL			
			3.79	.104 cop.	15.41	22ga NL			
			11.99	.080cw 40%	2.30	22ga H44			
					2.96	24ga NL			
					.25	24ga H44			
Totals for 17 loops		120.43	89.26		31.19				
Average loop		7.08	5.25		1.83		-1.41	643	





Table 3D - Subscriber Loop Lengths  
 Characteristics of Subscriber Loops Terminating in Each Zone

Project Number	System	Loop Length Miles	Open Wire Portion		Cable Portion		Effective Trans- mission db	Loop Resis- tance Ohms
			Miles	Gauge and Material	Miles	Gauge & loading		
Zone 4, 8 to 10 miles from Central Office								
Colo.501	Wiggins Tel. Co.	8.98	8.23	.109-135st	.75	19ga NL	-.33	694
		9.00	9.00	.109-135st	-		-2.45	686
Kan. 531	United Tel. Co.	9.10	8.40	.109-135st	.70	22ga NL	-.55	762
La. 504	LaSalle Tel. Co.	8.80	5.68	.109-135st	2.30	22ga H44	-.13	912
			.57	.104 cw	.25	24ga H44		
do	do	9.00	6.44	.109-135st	2.56	22ga H44	+.06	931
La. 506	Lafourche Tel. Co.	9.84	8.14	.104 Cop.	1.70	22ga NL	-4.22	375
do	do	8.43	3.79	.104 Cop.	4.40	22ga H44	-1.05	877
					.24	24ga H44		
Mich.503	Lawrence Tel. Co.	8.65	3.75	.109-135st	1.70	22ga NL	-.08	749
			2.84	.104 cw	.36	24ga NL		
NC 509	Yadkinville	8.35	6.75	.109-135st	1.60	22ga NL	+.49	790
Utah 501	Emery County	8.96	8.28	.080 cw	.68	22ga NL	-4.56	478
N.Mex504	Clovis Tel. Co.	9.00	8.50	.109-135st	.50	19ga NL	-.60	688
do	do	9.00	7.50	.109-135st	1.50	19ga NL	+.50	702
do	do	8.88	5.88	.109-135st	3.00	19ga NL	-.30	705
do	do	9.03	5.53	.109-135st	3.50	19ga NL	-.50	720
Tex. 528	Wes Tex. Tel. Coop.	10.00	6.00	.109-135st	4.00	19ga H88	+.05	800
Miss.506	Bay Springs	9.28	1.14	.109-135st	6.40	19ga H88	-.05	989
					1.70	22ga H88		
					.04	24ga H88		
		9.28	3.41	.109-135st	4.13	19ga H88		925
					1.70	22ga H88	+.08	
					.04	24ga H88		
Subtotal			86.21	.109-135st	9.25	19ga NL		
			15.34	.104cw 30%	4.53	19ga H88		
			8.28	.080cw 40%	6.38	22ga NL		
					12.66	22ga H88		
					.36	24ga NL		
					.57	24ga H88		
Totals for 17 loops		53.58	109.83		43.75			
Average loop		9.03	6.46		2.57		-.46	766





Table 3D - Subscriber Loop Lengths  
Characteristics of Subscriber Loops Terminating in Each Zone

Project Number	System	Loop Length Miles	Open Wire Portion		Cable Portion		Effective Trans- mission db	Loop Resis- tance - Ohms
			Miles	Gauge and Material	Miles	Gauge and Loading		
Zone 5, 10 to 12 miles from Central Office								
Colo. 501	Wiggins Tel. Co.	10.00	9.25	.109-135 st	.75	19ga NL	+.11	772
Kan. 531	United Tel. Assn.	10.18	9.48	.109-135	.70	22ga NL	+.03	845
Ga. 536	Bullock County	11.76	11.48	.080 cw	.28	22ga NL	-4.28	536
do	do	11.59	10.53	.080 cw	1.06	22ga NL	-2.81	620
La. 504	LaSalle Tel. Co.	11.47	6.44	.109 st	1.35	19ga H44	-.40	963
			1.89	.104 cw	1.79	22ga H44		
do	do	10.42	1.14	.109 st	5.87	19ga H44	-.23	867
			2.08	.104 cw	1.33	22ga H44		
do	do	11.17	6.68	.109 st	2.30	22ga H44	+.01	923
			2.94	.104cw	.25			
Miss. 506	Bay Springs	10.42	3.41	.109 st	6.71	19ga H44	+.11	905
					.30	24ga H44		
do	do	11.55	3.03	.109 st	6.70	19ga H44	+.01	918
			1.52	.104 cw	.30	24ga H44		
do	do	11.17	3.28	.109 st	6.72	19ga H88	-.13	902
			.94	.104 cw	.23	24ga H88		
NC 509	Yadkinville	11.10	9.50	.109-135 st	1.60	22ga NL	+1.79	1,000
N.Mex 504	Clovis Tel. Co.	11.00	11.00	.109-135 st	-		-1.50	840
do	do	10.90	9.40	.109-135 st	1.50	19ga NL	+1.40	847
do	do	10.86	7.36	.109-135 st	3.50	19ga H88	-.60	860
dp	do	11.00	6.00	.109-135 st	5.00	19ga H88	-.30	885
Tex. 528	Wes Tex Tel. Coop	11.00	11.00	.109 ss	-		-1.65	840
		11.00	5.00	.104 cw	2.00	19ga NL	+.39	648
			4.00	.109 ss				
		11.40	5.50	.109 ss	5.90	19ga H88	+.50	920
Utah 501	Emery County	10.89	10.21	.080cw	.68	22ga NL	-3.50	562
Subtotals			105.47	.109-135st	4.25	19ga NL		
			32.22	.080 cw	41.75	19ga H44		
			14.37	.104 cw	4.32	22ga NL		
					5.42	22ga H44		
					1.08	24ga H44		
Total for 19 loops		208.88	152.06		56.82			
Average loop		10.99	8.00		2.99		-1.54	834





Table 3D - Subscriber Loop Lengths  
Characteristics of Subscriber Loops Terminating in Each Zone

Project Number	System	Loop Length Miles	Open Wire Portion		Cable Portion		Effective Transmission db	Loop Resistance Ohms
			Miles	Gauge and Material	Miles	Gauge and Loading		
Zone 6, 12 to 14 miles from Central Office								
Colo.501	Wiggins Tel. Co.	14.50	11.25	.109-135st	.75	19ga NL	+.75	988
			2.50	.104 cw				
		13.00	13.00	.109-135st	-		-.25	980
Ga. 536	Bullock County	12.78	9.75	.080-40%	3.03	22ga H44	-1.80	925
		13.26	10.23	.080-40%	3.03	22ga H44	-1.63	945
Kan. 531	United Tel. Assn.	15.85	9.00	.109-135st	2.60	22ga H44	-.08	883
			4.25	.104 cw				
La. 504	LaSalle Tel. Co.	12.59	3.98	.109-135st	2.94	19ga H44	-.02	926
			3.88	.104 cw	1.79	22ga H44		
do	do	12.00	7.20	.109-135st	2.72	19ga H44	+.04	1,008
			2.08	.104 cw				
Miss.506	Bay Springs	12.69	5.49	.109-135st	5.87	19ga H44	-.01	997
			1.03	.104 cw	.30	24ga H44		
do	do	13.07	4.17	.109-135st	6.25	19ga H44	+.07	974
			2.27	.104 cw	.19	22ga H44		
					.19	24ga H44		
do	do	13.26	4.73	.109-135st	6.12	19ga H44	+.12	1,000
			2.09	.104 cw	.32	24ga H44		
N.Mex504	Clovis Tel. Co.	13.00	13.00	.109-135st	-		-.70	998
		13.00	12.00	.109-135st	1.00	19ga NL	+1.80	1,005
		12.86	9.86	.109-135st	3.00	19ga H44	.0	1,010
		13.00	8.00	.109-135st	5.00	19ga H44	+.90	1,035
Tex.528	Wes Tex.Tel. Coop	13.00	9.00	.104cw30%	4.00	19ga H88	-1.00	649
do	do	14.00	12.00	.109-135			+.62	989
			2.00	.104-cw30%				
Tenn.544	Twin Lakes	12.08	5.23	.109-135	4.05	22ga H88	+.75	1,165
			2.80	.104cw 40%				
	Subtotals		118.91	.109-135st	1.75	19ga NL		
			31.90	.104 cw30%	35.90	19ga H44		
			19.98	.080 cw40%	14.69	22ga H44		
					.81	24ga H44		
	Totals for 17 loops	223.94	170.79		53.15			
	Average loop	13.17	10.05		3.12		-.14	1,000





Table 3D - Subscriber Loop Lengths  
 Characteristics of Subscriber Loops Terminating in Each Zone

Project Number	System	Loop Length Miles	Open Wire Portion		Cable Portion		Effective Trans- mission db	Loop Resis- tance Ohms
			Miles	Gauge and Material	Miles	Gauge and Loading		
	Zone 7, Over 14 Miles							
Ga. 536	Bullock County	14.09	11.06	.080 cw 40%	3.03	22ga H88	-1.31	980
		18.02	17.60	.080 cw 40%	.42	22ga NL	-1.99	804
		15.76	15.72	.080 cw 40%	.04	22ga NL	-3.66	655
N.Mex504	Clovis Tel. Co.	15.00	15.00	.109-135 st	-		+ .10	1,140
		15.00	13.00	.109-135 st	2.00	19ga NL	+ 3.40	1,170
		15.00	11.00	.109-135 st	4.00	19ga H88	+ 2.20	1,180
Tex. 528	Wes Tex. Tel.Coop	16.00	9.00	.109-135 st	-		-1.06	929
			7.00	.104cw 30%				
		16.00	10.50	.109-135st	-		-.64	992
			5.50	.104 cw 30%				
		19.90	18.30	.104 cw 30%	1.60	19ga NL	+ .25	767
		17.50	16.50	.104 cw 30%	1.00	22ga NL	-1.29	738
		15.80	9.90	.104 cw 30%	5.90	19ga H88	+ .04	838
	Subtotals		58.50	.109-135st	3.60	19ga NL		
			57.20	.104 cw 30%	9.90	19ga H88		
			44.38	.080 cw 40%	1.46	22ga NL		
					3.03	22ga H88		
	Totals for 11 loops	178.07	160.08		17.99			
	Average loop	16.19	14.55		1.64		+ .34	936



Table 30 - Substation Loop Lengths  
 Characteristics of Substation Loops Forming in Each Zone

Project Number	System	Loop Length Miles	Open Wire Section		Cable Section		Blind-five Trips- meters up	Loop Resistance Ohms
			Miles	Gauge and Material	Miles	Gauge and Loading		
Zone I, Over 10 Miles								
525	Bullock County	11.02	11.06	.080 cw H02	3.03	22ga W88	-1.31	960
		18.02	17.60	.080 cw H02	1.12	22ga W8	-1.32	960
		15.76	15.72	.080 cw H02	1.01	22ga W8	-1.32	962
526	Clavis Tel. Co.	15.00	15.00	.109-135 st	-		+ .70	1,110
		15.00	13.00	.109-135 st	2.00	19ga W8	+ 3.10	1,170
		15.00	11.00	.109-135 st	1.00	19ga W88	+ 2.20	1,180
528	Tex. Tel. Coop.	16.00	7.00	.109-135 st	-		-1.06	959
		16.00	7.00	.101 cw 308	-		-1.06	959
		16.00	10.50	.109-135 st	-		-1.06	952
		16.00	2.50	.101 cw 308	-		-1.06	952
		16.00	18.30	.101 cw 308	1.00	19ga W8	+ 2.22	967
		17.50	16.50	.101 cw 308	1.00	22ga W8	-1.32	938
		15.80	9.90	.101 cw 308	2.90	19ga W88	+ .08	838
Subtotals			58.50	.109-135 st	3.60	19ga W8		
			57.50	.101 cw 308	2.90	19ga W88		
			14.38	.080 cw H02	1.16	22ga W8		
					3.03	22ga W88		
Totals for 11 Loops		160.08			17.92			
Average Loop		14.52			1.64		+ .31	936